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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR		ATTORNEY DOCKET NO.
09/511,316	02/23/00	SAITO	Y	0068-0405-0

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EXAMINER	
KOSLOW,C	
ART UNIT	**PAPER NUMBER**
1755	4

DATE MAILED: 02/21/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary	Application No. 09/511,316	Applicant(s) SAITO, YASUYOSHI	
	Examiner C. Melissa Koslow	Art Unit 1755	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claims _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are objected to by the Examiner.

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

Attachment(s)

15) ☒ Notice of References Cited (PTO-892)
16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
17) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *1,3* .
18) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
19) ☐ Notice of Informal Patent Application (PTO-152)
20) ☐ Other: .

The drawings, filed 23 February 2000, are approved by the Draftsperson under 37 CFR 1.84 or 1.152.

The Japanese references, cited in the Information Disclosure Statement of 23 February 2000, were considered with respect to the provided English abstracts.

The listing of references on page 2 of the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

The disclosure is objected to because of the following informalities: In tables 3 and 4, "$Na_{0.8}$" should be "$Nb_{0.8}$". On page 17, "curie" should be capitalized.

The composition of the taught niobate base material is unclear from the specification. Page 4, lines 5-7 and example 2 teaches Li, Ta and Cu are substitutional solid solubilization agents, which means that Li and Cu substitute for the alkali metal and tantalum substitutes for niobium. Page 5, line 14 through page 6, line 1 and example 1 teaches Li, Cu and Ta are sintering aids for the niobate. This means these compounds do not substitute for any of the atoms in the niobate. Applicants need to clarify which embodiment applicants are attempting to define, or if it is both embodiments, then they should both embodiments should clearly de defined. If Li and Ta are substitutional agents, then it is unclear if the composition $Li_x(K_{1-y}Na_y)_{1-x}(Nb_{1-z}Ta_z)O_3$ is the inventive composition or if the inventive composition is $(Li_{x+x'})(K_{1-y}Na_y)_{1-x}(Nb_{1-z}Ta_{z+z'})O_3$, where z' and x' are additional amounts of lithium and tantalum. It is also unclear what is the

inventive composition if A is Li and the additive is Li. In the disclosed process, it is unclear what is meant by "a mixture powder represented by a composition formula $ANbO_3$", the actual niobate, as in example 1, or a mixture of precursor compounds for the niobate, as in example 2. In addition, it is unclear the form of the additives, elemental, as implied by the majority of the specification, or as a compound, as taught by the examples. Appropriate correction is required.

Claims 1-12 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claimed composition and process are indefinite for the reasons given above.

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1 and 2 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Hofmeister et al, the article by Hofmeister et al or Güther et al, each applied individually.

All of these references teach alkali metal niobate materials containing Li and Ta additives or Li, Ta and Cu additives. Güther et al teach an alkali metal niobate based material having the formula $K_{1-y}M_yNb_xTa_{1-x}O_3$, where M is a monovalent metal ion other than potassium, y is 0 or 0.02-0.2 and x is 0.05-0.95. M is preferrably lithium or sodium (col. 2, lines 12-14). The article by Hofmeister et al and Hofmeister et al both teach an alkali metal niobate based material having the formula $K_{1-y}Li_yNb_xTa_{1-x}O_3$ or the formula $K_{1-y}Li_yNb_xTa_{1-x}O_3$:Cu. The taught amount of sodium in each reference falls within the claimed ranges. The article by Hofmeister et al teaches

the undoped and the copper doped niobates are ferroelectric or piezoelectric materials. While Güther et al do not teach the taught compositions are piezoelectric material, one of ordinary skill in the art would expect them to inherently be piezoelectric, absent any showing to the contrary. This is because the taught compositions are identical to those claimed. The claimed compositions clearly read upon those taught.

Claims 1 and 7-9 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by the abstract for JP 55-55589 or Henson et al.

Both of these references teach a piezoelectric alkali metal niobate composition containing lithium as an additive. The compositions are produced by adding lithium carbonate to a mixture powder containing niobium pentaoxide and an alkali metal carbonate, such as sodium carbonate; molding and sintering the mixture and giving the sintered article piezoelectricity by poling. the abstract teaches atmospheric pressure sintering and Henson teaches mechanically pressed sintering. Since the type of sintering furnace is not defined, this means a conventional electric sintering furnace was used. It is standard practice in the art not to define the type of furnace unclear is not a non-conventional one or if the method of heating is not the conventional method. The claimed composition and method clearly read upon the taught compositions and methods.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 3, 5 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Güther et al.

As stated above, Güther et al teach an alkali metal niobate based material having the formula $K_{1-y}M_yNb_xTa_{1-x}O_3$, where M is a monovalent metal ion other than potassium, y is 0 or 0.02-0.2 and x is 0.05-0.95. M is preferrably lithium or sodium (col. 2, lines 12-14). The taught amount of Ta and Li overlap the claimed ranges. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed composition.

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hofmeister et al or the article by Hofmeister et al.

As stated above, both of these references teach a piezoelectric alkali metal niobate based material having the formula $K_{1-y}Li_yNb_xTa_{1-x}O_3$:Cu or the formula $K_{1-y}Li_yNb_xTa_{1-x}O_3$. The values of x and y in the article are x is 0-1 and $y \leq 0.13$, excluding zero. The amount of copper taught in the article is zero or 0.4 mol%. The patent teaches x is 0-1, y is 0.0001-0.15 and copper is present in the amount of 0-10 mol%. The taught amount of Cu, Ta and Li overlap the claimed ranges. Product claims with numerical ranges which overlap prior art ranges were held to have been obvious under 35 USC 103. *In re Wertheim* 191 USPQ 90 (CCPA 1976); *In re Malagari* 182 USPQ 549 (CCPA 1974); *In re Fields* 134 USPQ 242 (CCPA 1962); *In re Nehrenberg* 126 USPQ 383 (CCPA 1960). The reference suggests the claimed composition.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Melissa Koslow whose telephone number is (703) 308-3817. The examiner can normally be reached on Monday-Thursday from 7:30 AM to 4:00 PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Bell, can be reached at (703) 308-3823.

The fax number for Amendments filed under 37 CFR 1.116 or After Final communications is (703) 872-9311. The fax number for all other official communications is (703) 872-9310.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661 or (703) 308-0662.

cmk
February 21, 2001

C. Melissa Koslow
Primary Examiner
Tech. Center 1700